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# HASTINGS ASPHALT BLOCKS



## METHODS OF INSTALLATION

*C. Hyatt*

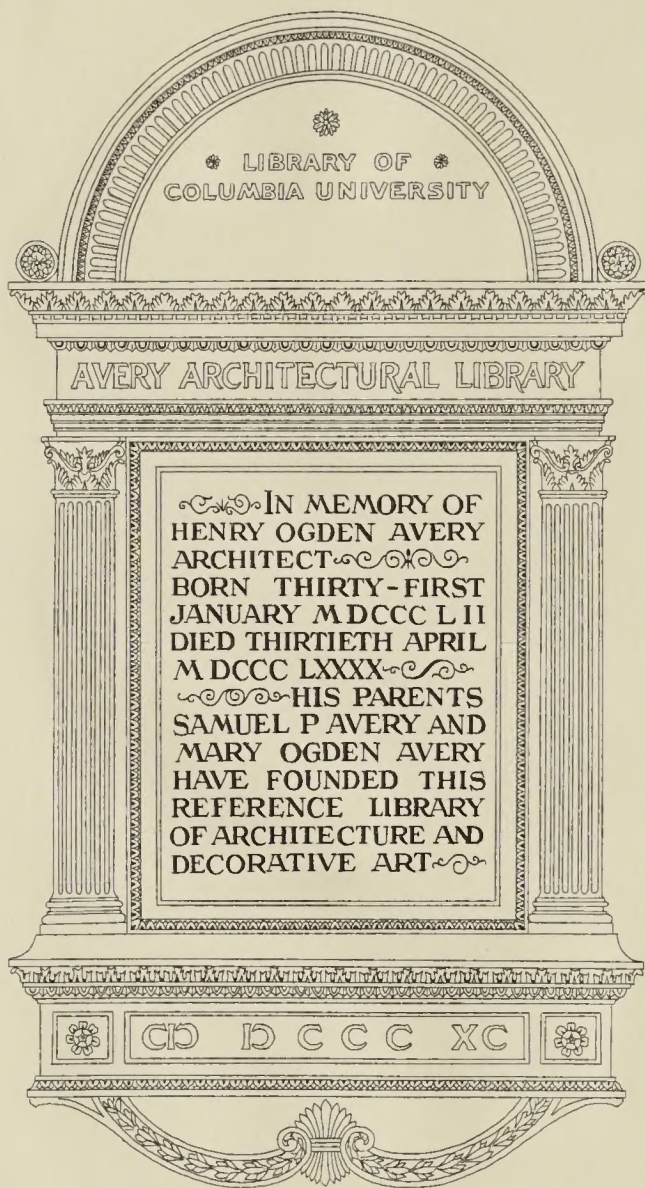
**THE HASTINGS PAVEMENT COMPANY**

**25 Broad Street, New York City**

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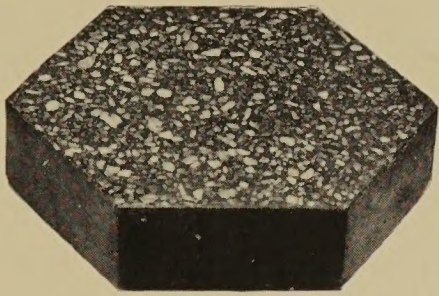




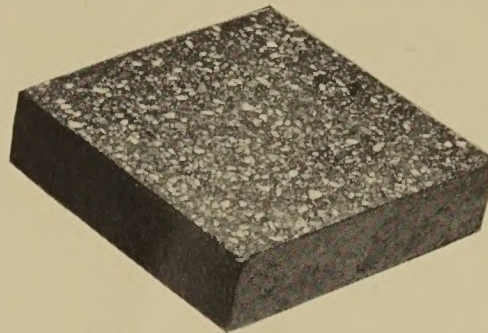
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## M E T H O D S   O F   I N S T A L L A T I O N

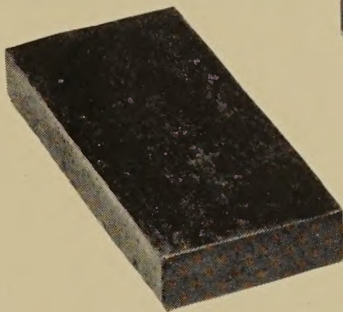
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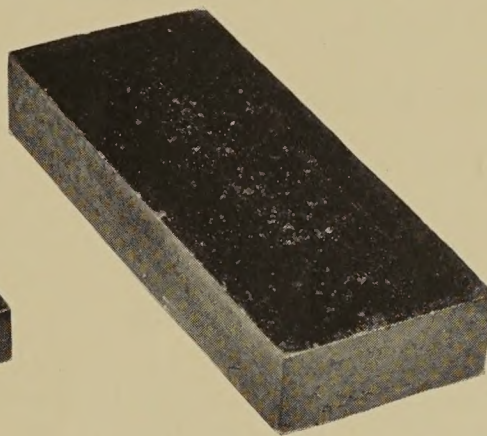
Hexagonal Tile



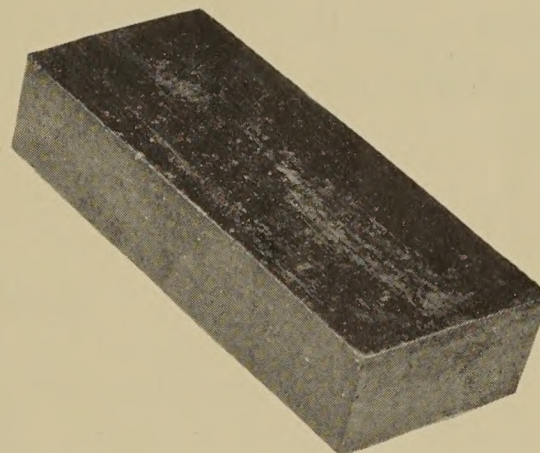
Square Tile



8" x 4" x 1¼"  
Asphalt Block



5" x 12" x 2"  
Asphalt Block



5" x 12" x 2½"  
Asphalt Block

# Asphalt Paving Blocks

Asphalt Blocks fall into three groups based on the service to be rendered:

1. **STANDARD 5" x 12" PAVING BLOCKS** for streets and roads, heavy-duty industrial floors, piers, bridges, airports and all areas subjected to heavy concentrated traffic. They are manufactured in the following sizes:

5" x 12" x 2" (deep)

5" x 12" x 2½" (deep)

5" x 12" x 3" (deep)

Condition and type of foundation, kind and volume of traffic are the principal controlling factors in selection of blocks of the proper thickness for the work to be performed. In almost all instances where an adequate foundation is provided, the 2" block will fulfill all normal requirements for the heaviest traffic. Where semi-rigid, bituminous, old pavement or other special foundations are employed, or as in the case of some industrial and airport projects where the natural soil is to serve as foundation, use of the 2½" or 3" blocks may be advisable.



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## H A S T I N G S   A S P H A L T   B L O C K S

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2. **EIGHTFOURS** 8" x 4" for light-duty main floors and upper floors where weight is a necessary consideration, for roofs, loading platforms, driveways and streets where traffic is not too heavy or highly concentrated, and for waterproofing protection. Eightfours are furnished in the following standard size:

8" x 4" x 1 $\frac{1}{4}$ " (deep)

3. **ASPHALT TILES** used in walks, driveways and paths are particularly appropriate for parks, cemeteries, schools and recreational grounds. Two shapes and sizes can be supplied:

Hexagonal 8 $\frac{1}{2}$ " (between parallel sides) x 2" (deep)

Square 8" x 8" x 2" (deep)

Variation of the above sizes of Blocks, Eightfours and Tiles may be made to meet special conditions.

### Asphalt Block Weights

Size	Pounds Per Blk.	Pounds Per Sq. Yd.	Net Tons Per Thousand
5" x 12" x 2"	10.6	228	5.3
5" x 12" x 2 $\frac{1}{2}$ "	13.3	286	6.65
5" x 12" x 3"	15.7	338	7.85
8" x 4" x 1 $\frac{1}{4}$ "	3.5	142	1.78
Hexagonal Tile	10.8	227	5.4
Square Tile	11.0	222	5.5

### Asphalt Blocks—Quantities

Size	*Blocks per Square Yard		Approx. Sq. Yds. per Ton	Sq. Yds. per M.	Blks. per Min. C/L 60,000 lbs.
	Regular	Non-Skid			
5" x 12" x 2"	21.5	19.7	8.8	47	5,660
5" x 12" x 2 $\frac{1}{2}$ "	21.5	19.7	7.0	47	4,511
5" x 12" x 3"	21.5	19.7	5.9	47	3,822
8" x 4" x 1 $\frac{1}{4}$ "	40.0	..	14.1	25	16,901
Hexagonal Tile	21.0	..	8.8	48	5,555
Square Tile	20.2	..	9.0	49	5,454

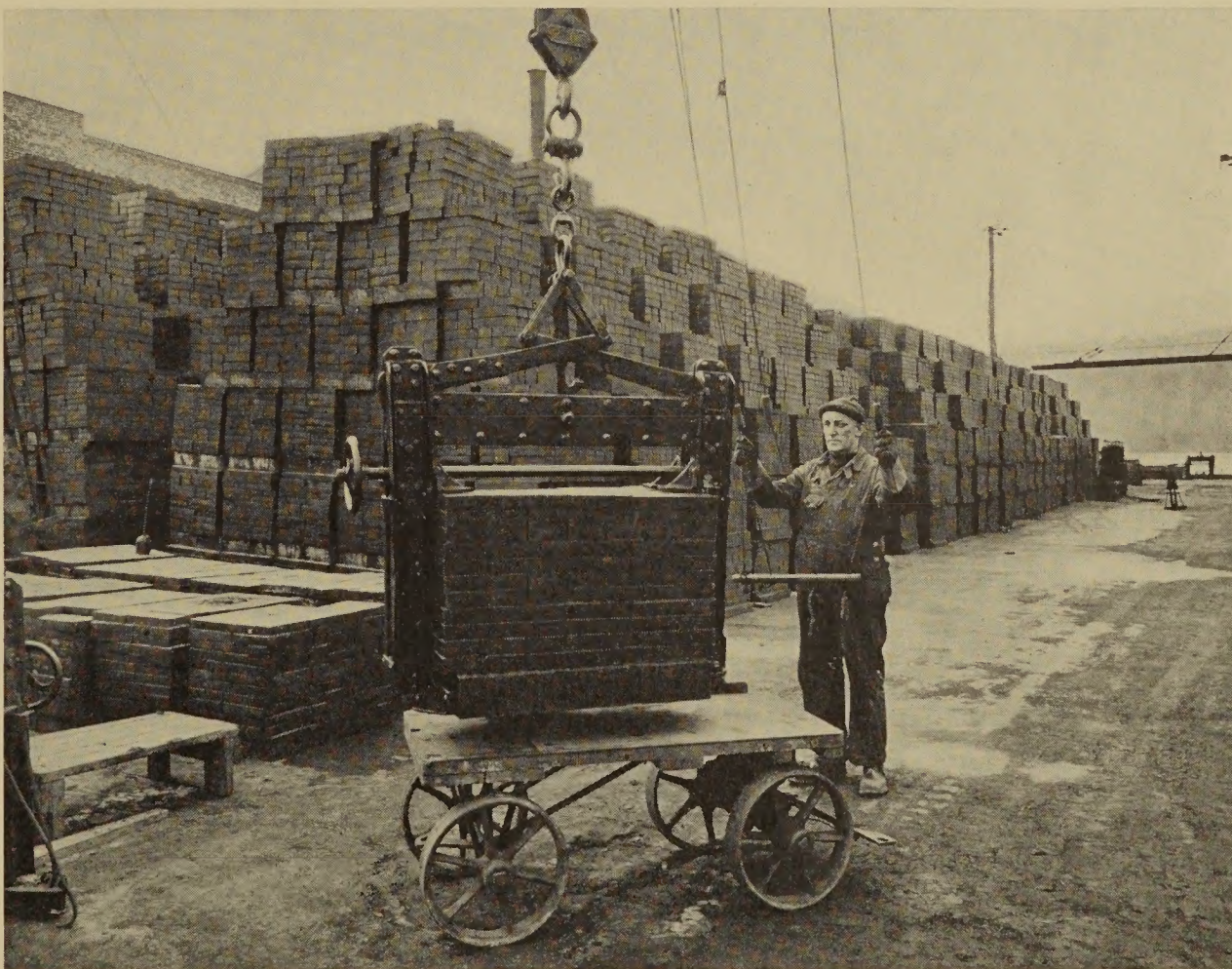
\*The figures given make due allowance for normal wastage.



## Shipping and Handling Asphalt Blocks

Asphalt Blocks are shipped from the factory by rail, water or truck, loaded in such a way as to insure arrival in good condition. Unloaded and rehandled with reasonable care, the blocks in the completed pavement will be free from warp, with edges and corners intact. Asphalt Blocks, because of their malleability, should never be left for more than a few hours unpiled in heaps and, if stored, should be stacked on a flat surface to prevent distortion. Blocks which have by chance become bent may be straightened by repiling on a flat surface, concave face down.

It should be noted that there are top and bottom sides to Asphalt Blocks. In stacking and laying, this distinction should if possible, be observed, in order that advantage may more readily be taken of the better bond between blocks and base which the slightly rougher bottoms of the blocks provide.



HANDLING ASPHALT BLOCKS IN ONE-TON PACKAGES WITH  
MECHANICAL TONGS



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## H A S T I N G S   A S P H A L T   B L O C K S

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### Labor Force Required for Laying Asphalt Blocks

A well organized and efficient force will lay and finish about 25 square yards of asphalt block pavement per man per 8-hour day. The following is a typical example of an economical working force where large continuous operations make possible the laying of a **minimum** of 700 square yards per day:

Mixing Mortar Bed .....	5 men
Setting strips .....	1 man
Spreading and striking mortar bed .....	4 men
Laying blocks .....	2 men
Aligning blocks (axeman) .....	1 man
Carrying blocks to layers .....	10 men
Cutting and fitting closures .....	2 men
Joint filling and sanding .....	2 men
Utility .....	1 man
	<hr/>
	28 men

The following are fairly representative of working forces for smaller operations:

### Average Crew for Jobs 500 to 3,000 Square Yards

Mixing mortar bed .....	2 men
Spreading and striking mortar bed .....	2 men
Laying blocks .....	2 men
Carrying blocks .....	8 men (6 to 10)
Cutting and fitting closures .....	1 man
Joint filling and sanding .....	1 man
	<hr/>
	16 men

Such a crew while somewhat out of balance could be adjusted to the work by shifting men from one operation to another. A force of this size should lay a minimum of 300 yards daily.

### For Jobs Under 500 Square Yards

Preparing and striking bed .....	3 men
Laying blocks .....	1 man
Carrying blocks .....	3 men (2 to 4)
Cutting and fitting closures .....	1 man
	<hr/>
	8 men

The man employed for cutting and fitting closures, with the help of one or two of the bed crew, could be used for filling joints. A force of this size could lay from 100 to 250 yards daily, depending on the kind of installation and prevailing local conditions.

### Labor Costs for Laying Asphalt Blocks

Using the foregoing examples of street paving organizations, if the average hourly wage is 50c, then the cost for laying minimum daily yardages of 700, 300 and 100 would be 16c per square yard, 21-1/3c per square yard and 32c per square yard respectively.

On floors or other industrial installations, the labor cost of laying Asphalt Blocks will often run 25% to 50% above street pavement costs. In estimating costs of such work, allowance should be made accordingly.



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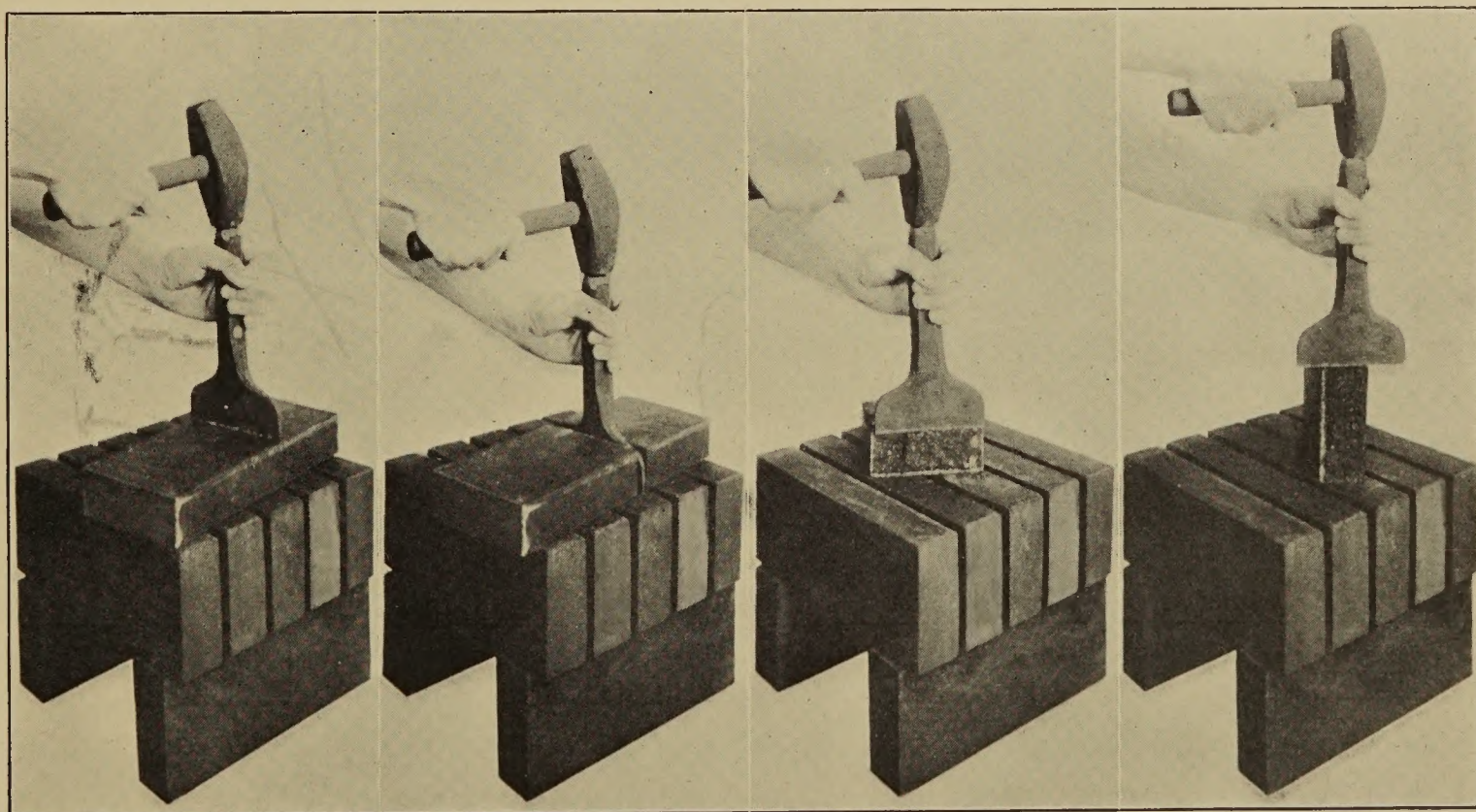
No single yardstick to measure the cost of laying Asphalt Blocks can be devised which will apply to all installations. Naturally, the cost will vary with the size of the job, the kind of job, the location of the work and other such qualifying factors.

### Tools for Laying Asphalt Blocks

In addition to ordinary shovels, rakes, brooms, long-handled axes, hammers, etc., only a very few special tools are needed to lay Asphalt Block Pavements.

1. A mortar bed straightedge or striker with handles at each end made of 5" steel channel about 16 feet long.
2. Mortar bed strips or guides for the striker of  $\frac{1}{8}$ " x 4" flat steel from 4' to 10' in length.
3. Block-cutting chisels with 4" or 5" cutting edges (depending on whether 4" x 8" or 5" x 12" blocks are to be laid) used with a 4-pound hand hammer for cutting and trimming the blocks; or in case of large jobs a specially designed block cutting machine by which a great saving in labor may be effected.
4. Asphalt heating kettle of any standard make or design similar to the type used in roofing work.
5. Tools for raking non-skid joints.
6. Rubber shod hand squeegee or preferably a specially designed hand operated squeegee machine which applies and spreads the hot asphalt in a single operation.

For the convenience of users, all of the above special tools or appliances will be supplied by this Company at reasonable prices.



Hand Cutting and Trimming Asphalt Blocks



## Standard 5" x 12" Asphalt Block Street Pavements

### Foundation and Preparation of Mortar Bed

Asphalt Block Pavement for maximum service should be laid on a rigid foundation of a thickness sufficient for the prevailing traffic and subsoil conditions. Making allowance for mortar bed and blocks, the foundation should be finished to conform exactly to grade, but with a slightly roughened surface to establish a firm bond between foundation and mortar bed.

Properly prepared mortar bed requires clean, sharp, well-graded sand, carefully mixed with cement in proportions of 1 part cement to  $2\frac{1}{2}$  or 3 parts of sand, and thoroughly and uniformly dampened. The finished mortar should be of such consistency that it will work easily, will not disintegrate, and will not slump or release free water when lightly compressed by patting. Where an efficient mixer is available which will insure accurate proportioning and uniform free discharge, machine mixing is preferable to mixing by hand. In either case, the essential thing is that the mortar be thoroughly mixed to give best results.

### Striking and Finishing Mortar Bed

The foundation having been thoroughly wetted, the fresh mortar is spread over the area first to be paved, and the  $\frac{1}{8}$ " x 4" steel strips are set in packed mortar across the street in parallel rows about 15 feet apart. These strips should be carefully positioned and gauged to conform to finished grade so that base irregularities may not be reflected in the finished surface.

The straightedge or striker is then drawn along the steel strips in a series of short sweeps so as to carry the surplus mortar ahead of the advancing striker. Removing this excess or providing additional material as occasion requires, the bed is struck and restruck across the street from curb to finishing point until smooth, firm and free from lumps, ridges or spongy spots. It is of great importance that the striker remain straight and true. It should, therefore, be frequently inspected and if bent or warped a new striker should immediately be provided. Otherwise, an irregular bed with consequent surface roughness is sure to result.

From the completed bed, one set of strips is taken up and set for the next bed, the trench thus left is filled with fresh mortar and carefully raked or preferably screeded with a short wooden straightedge about two feet in length until uniform with the adjacent bed. It is never permissible to spread the mortar bed more than one-half hour in advance of the laying.

### Laying the Blocks

On the fresh mortar bed, the blocks are laid, each paver carrying three rows simultaneously across the street. For the convenience of the layers, block carriers place the necessary blocks in piles of three on each joint of the row previously laid. As each triple row is carried along, the paver, using another block as a tamper, raps the surface of the middles—not the ends—of the blocks to be tamped in order to bed them solidly and align them evenly with adjoining blocks. This rapping or tamping must be done as directed in order that each block may be uniformly



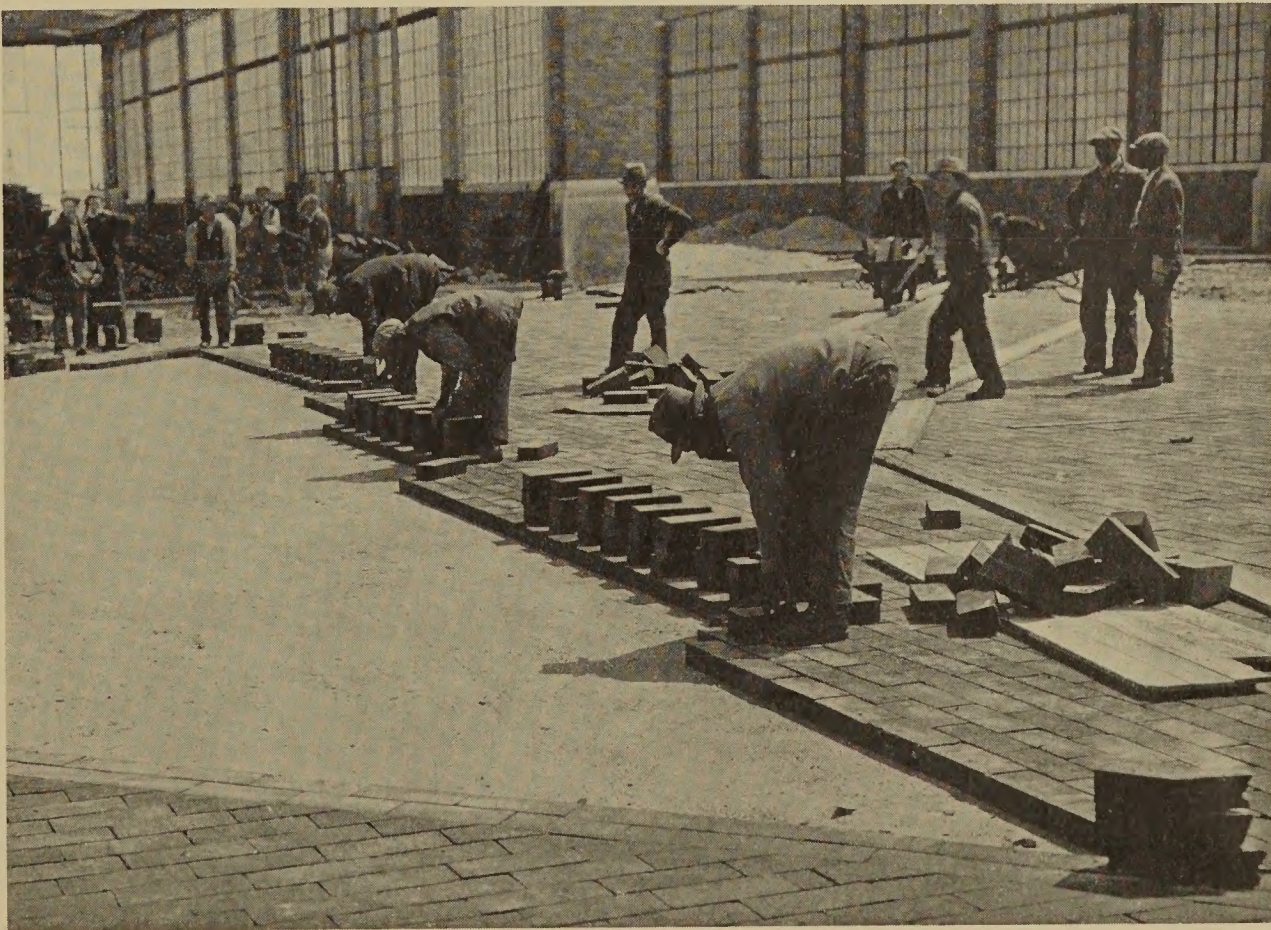
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BRONX RIVER PARKWAY, WESTCHESTER COUNTY, N. Y.  
Striking and Finishing the Mortar Bed



MUNICIPAL AIRPORT—FLOYD BENNETT FIELD, NEW YORK CITY  
Laying 5" x 12" x 3" Asphalt Blocks



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## H A S T I N G S   A S P H A L T   B L O C K S

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set in the mortar throughout its entire bottom area. Tamping across the ends instead of the middles of the blocks is apt to force the rapped ends down with the opposite ends left high, and the natural effort to correct this condition by driving the high end back allows the blocks to rest on an uneven cushion high in the middle with consequent rocking of the blocks after the mortar has hardened.

The first row laid is started with a whole block, the second with an 8" piece, the third with a 4" piece and so on, thus breaking the joints by a 4" lap.

The pieces of block required for closing the rows at the finishing point—in no case less than 3" in length—having been cut to desired length by hand or machine, should be fitted and adjusted to finished grade before the mortar bed has taken an appreciable set.

One man with an ordinary long-handled axe, employed to drive back bulges in the line of paving and to correct other alignment irregularities, can readily keep the blocks tight and the courses at right angles to the center line of the street. Final adjustment of alignment and surface inequalities may be made by an inspector following closely behind the pavers.

### Filling the Joints

Asphalt is almost universally used as joint filler for street pavements. It penetrates well into the joints, cements together the block units and effectively helps to seal and waterproof both pavement surface and base. It may be applied hot in the form of heated asphalt or cold as an asphalt emulsion. Application is as follows:

(a) **Hot Asphalt Joint Filler:** The surface of the pavement having been swept and the transverse joints broomed clean, hot asphalt at a temperature of about 350° F. is poured on the pavement in small quantities and forced into the joints with rubber-shod squeegees, taking care as far as possible to clean all surplus asphalt from the block surface. A single application is, in almost all instances, sufficient for satisfactory filling of the joints. This is followed by a thin, uniform coating of dry, fine sand which, under traffic, is consolidated with the filler and forced into the joints, thus automatically continuing the joint-filling process.

Depending on weather, temperature and condition of pavement, one gallon of the hot asphalt properly applied in a single application will be sufficient to fill the joints adequately for the following number of square yards of pavement:

Sq. Yds. per Gal.	5" x 12" x 2"	5" x 12" x 2½"	5" x 12" x 3"	8" x 4" x 1¼"
Maximum	5.0	4.5	4.0	8.0
Minimum	4.0	3.5	3.0	6.0

Upon completion of the application of joint filler, the pavement should remain closed to all traffic for about 7 days in order that the mortar bed may not be disturbed before it has set firmly.



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## M E T H O D S   O F   I N S T A L L A T I O N

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(b) **Emulsified Asphalt Joint Filler:** The surface of the pavement must be swept clean and the emulsion applied to a dry surface in dry weather. Only pure emulsion unmixed with mineral matter should be used. Such an emulsion containing about 60% of asphalt and about 40% of water will have a coverage of approximately 3 square yards of 5" x 12" x 2" (deep) asphalt blocks per gallon of emulsion. It should be poured evenly over a marked area on the surface of a size to permit the contents of the pouring pot to cover at the above rate. For example, if a three-gallon open-spout sprinkling can is used, the area to be marked off and treated will be about nine square yards. The emulsion is then wiped into the joints by rubber-shod squeegees, care being taken to leave as little as possible on the surfaces of the blocks. As soon as the emulsion on any area poured shows a black appearance but before it has set, a thin sprinkling of clean fine sand is broomed over the surface.

As in the case of hot asphalt joint filler, the pavement should remain closed to traffic for about one week after the emulsion has been applied.

When carefully and properly used, the quantity of emulsion remaining on the surface will be inappreciable and danger of surface stickiness avoided.



**MUNICIPAL AIRPORT—FLOYD BENNETT FIELD, NEW YORK CITY**

General view Asphalt Block Pavement in front of hangars. Shows, in the foreground, application of the Asphalt Joint Filler; in the background, Blocks being laid.



### Non-Skid Construction

This type of construction has proven remarkably effective for prevention of skidding on grades and curves, at intersections, traffic signals or wherever congestion of traffic necessitates sudden stops.

To lay Non-Skid Asphalt Block Pavement, the blocks are placed on the usual mortar bed one row at a time, spaced by  $\frac{3}{8}$ " x 2" spacing strips set on edge between each transverse course. The strips are then removed and the joints filled nearly to the top with a free flowing grout containing 1 part cement and  $1\frac{1}{2}$  parts sand. In about one-half hour, the grout having taken an initial set, the joints are raked to a depth of not less than  $\frac{3}{8}$ " with a special tool closely fitted to the joint so as to leave a clear-cut groove  $\frac{3}{8}$ " to  $\frac{1}{2}$ " wide and  $\frac{3}{8}$ " to  $\frac{1}{2}$ " deep.

By laying at the gutter lines a single row of blocks longitudinally with the curb, and depressed about  $\frac{1}{2}$ " to the level of the top of the raked joints, provision is made for drainage of the recessed joints, an important factor in Non-Skid Construction.

Where ordinary Portland Cement is used in preparing the grouted joints, Non-Skid Asphalt Block Pavements should be thoroughly wetted each morning and afternoon for a period of not less than seven days, in order that too rapid setting may not impair the solidity or disturb the structure of the cement-grouted joints. The pavement should be kept free of traffic for at least eight days from date of completion, or as long thereafter as may be needed for the cement grout to attain serviceable strength.

If high early strength cement is used, the period during which the pavement should be kept wet and free of traffic may be reduced to the time required for setting of the grout—usually about forty-eight hours.



ALBANY POST ROAD—DOBBS FERRY, N. Y.  
Asphalt-Block Non-Skid Construction



## METHODS OF INSTALLATION



① Laying Asphalt Block Non-Skid Construction at 97th St. and Riverside Drive, New York City. The Asphalt Blocks are laid one row at a time, with a  $\frac{3}{8}$ -inch strip between each course.



② Above—Photo shows the  $\frac{3}{8}$ -inch strip between each row of blocks.



③ Left—Photo shows the  $\frac{3}{8}$ -inch strips being pulled out.



④ Applying grout to the joints after the strips have been removed



⑤ Finishing recessed joints which prevent skidding

## Non-Skid Construction



## Asphalt Block Industrial Pavements

### For Docks, Piers and Heavy-Duty Industrial Floors

Preparation and placing of mortar bed and laying the blocks follow the same methods used in street pavements.

For exterior work where conditions similar to those on street work prevail, hot asphalt or pure emulsion joint filler as described on pages 10 and 11 give best results. On interior or protected exterior work the general practice is to use as joint filler a mineral asphalt emulsion mixed one part emulsion and one part neat cement grout with sufficient added water to permit easy flow over the surface and into the joints. This material, like the pure emulsion, must be squeegeed into the joints in one or more applications until the joints are filled, with a minimum amount remaining on the surface.

Where the pavements are not subjected to high-speed traffic and do not require protection from the weather, joints may be filled with sand or sand-cement grout as follows:

### Sand Joints

Clean, dry, sharp sand is broomed or otherwise worked into the joints at an average rate of one cubic yard of sand to about 200 square yards of surface. Surplus sand remaining on the surface should be swept into the joints at intervals until they are solidly packed and completely filled.

### Sand-Cement Grout Joints

This grout is prepared of one part of cement and one and one-half parts of sand. Mixed with an excess of water for easy flow, the grout is worked into the joints with broom or squeegee, usually because of shrinking in drying, in two applications at intervals of one or two days. Traffic should be prohibited for at least seven days or as long as conditions of weather or traffic may dictate.

### Non-Skid Construction

On ramps or other grades, or where there is danger of skidding, effective use can be made of Non-Skid construction as described on page 12.

### Use of Sand or Natural Soil Foundation

On installations where the natural soil is to serve as foundation, it should be thoroughly compacted by use of a 7½ to 10 ton roller (depending on whether the soil is sandy or loamy); the surface of the compacted base should then be loosened and struck to a true grade, the blocks laid in this sand bed, the surface rolled with a five-ton roller and joint filler applied as described for regular street and industrial pavements.



### **Eightfours for Industrial Floors, Roofs, Platforms**

Eightfours are laid in much the same manner as the 5" x 12" blocks. In starting the courses, however, whole and half blocks are used alternately to provide the 4" break in the joints. The pavers carry four instead of three rows simultaneously across the surface and this in turn requires that the block carriers place the blocks in piles of four on each joint of the previously laid row. Eightfour blocks should be initially tamped by striking one block across the middle of each lot of four blocks in the row being laid in the same manner as the larger blocks are tamped. Because of their smaller size and reduced bearing surface, a supplementary tamping is necessary to insure proper bedding and alignment. This is accomplished by striking a plank about 2" x 10" x 6' with a tamp weighing 50 to 100 pounds and manned by one or two men, depending on the weight and effort needed to drive the blocks firmly into place. During the laying, pavers are required to stand and walk on planks placed over the newly-laid blocks in order that displacement or tilting out of position of the smaller and lighter block units may not result in a roughened surface.

The joints in Eightfour Asphalt Block Pavement are filled with emulsified asphalt or sand-cement grout by the same method used in standard street pavements and dock, pier and heavy-duty industrial floor surfaces. When laid with asphalt joints a light coating of fine clean sand spread over the surface will prevent the pavement from becoming sticky or tacky under traffic.

### **Eightfours for Waterproofing Protection**

Eightfour Asphalt Blocks laid over waterproofing fabric provide a most effective shield for protecting this waterproofing on bridges and viaducts. The customary construction method is to flush the surface of the base with a thin coating of hot asphalt, lay the waterproofing fabric thereon, apply a second mop coat of hot asphalt over the fabric, lay the asphalt blocks in this second mop coat, making sure the blocks are firmly set with tight joints, and complete the installation with a final heavy application of hot asphalt spread over the blocks and flushed into the joints.



HACKENSACK RIVER BRIDGE—D. L. & W. R. R.  
Protecting Waterproofing with Eightfour Asphalt Blocks



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TEXAS & PACIFIC RY. FREIGHT TERMINAL—FT. WORTH, TEXAS  
Asphalt Block Industrial Floor and Loading Platform



PIER No. 4, U. S. ARMY SUPPLY BASE, NEW YORK CITY



## Classified Asphalt Blocks

**CLASSIFIED ASPHALT BLOCKS** have a particular usefulness in the field of industrial floors and pavements where it is desired to lay the surface without compensating cushion directly on a screeded concrete foundation, thus eliminating small inequalities of surface always found in ordinary street and highway pavements. With the permissible variation in the thickness of classified blocks reduced to  $1/64$ " in either direction, their use insures a uniformly smooth surface with no detectable differences in the setting of the individual blocks.

Classified Asphalt Blocks for laying directly on the base, as described below, are furnished at reasonable extra cost.

### Laying Classified Blocks

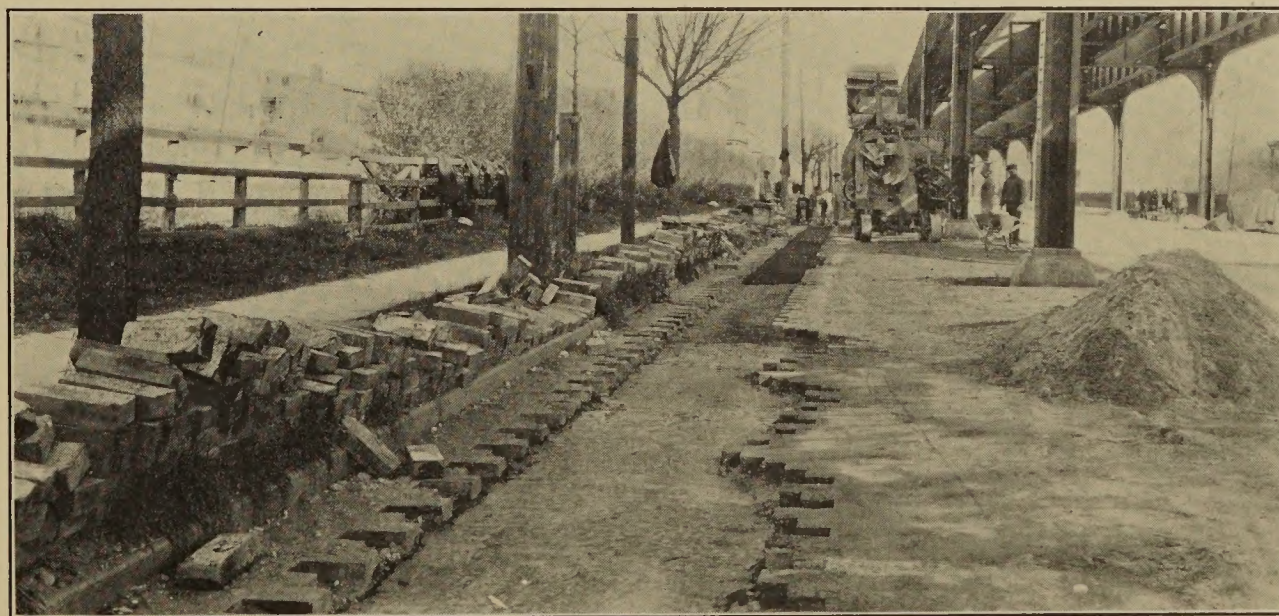
The concrete base having been carefully screeded to a smooth, accurate finish, a paint coat of hot asphalt or emulsified asphalt is applied evenly thereon to serve as a bonding agent between surface and foundation.

It must be kept in mind that Classified Asphalt Blocks are meant to lay **directly** on the screeded base and that the bituminous paint coat, intended solely as a binder, must under no circumstances be so thick as to serve as a cushion between surface and base. The hot asphalt or emulsion must, therefore, be of such consistency that it can be squeegeed over the surface in a smooth uniform coat of a maximum thickness never to exceed one-sixteenth inch ( $1/16$ ").

On the paint coat placed over the screeded foundation as described, the Classified Asphalt Blocks are immediately laid and the joints filled with asphalt emulsion in the usual manner.

## Relaying Asphalt Blocks

Where cuts or openings in pavements necessitate removal of a portion of the surface, the blocks before relaying should be cleaned of all adhering mortar or asphalt. They should then be relaid in fresh mortar exactly flush with the adjoining pavement, the joints filled with hot asphalt or asphalt emulsion, a thin coating of clean sand applied, and the replaced blocks kept free of traffic until the bed is firm and the joint filler hardened.



Preparing trench cut in pavement for relaying Asphalt Blocks





G. A. R. MEMORIAL HIGH SCHOOL—WILKES BARRE, PA.  
Asphalt Tile Walk

## Asphalt Tiles

Asphalt Tiles may be laid on any base with either sand cushion or mortar bed. In almost all instances, however, a well-compacted sand base not less than 6" in thickness will prove entirely satisfactory.

The surface of the sand is struck in the same manner as a mortar bed to provide a cushion for the tiles. Beginning courses with a whole and half tile alternately, the tiles are laid with close joints and the courses closed at the opposite ends by cutting and fitting pieces of the required size and shape. As thus laid, the tiles are imbedded firmly and aligned evenly by striking a 2" x 12" x 10' plank placed on the surface, with any convenient two-man rammer weighing in the neighborhood of 100 pounds. Such a rammer can be made economically of a 12" x 12" block of wood about 3 feet long with a wood handle on each of two sides.

Tiles should be held in place by some effective edging. Rows of square tiles set on edge and extending about 1" above the pavement, make a harmonious, economical and adequate curbing with the added advantage of easy realignment or relaying if relocation or repairs to the tile pavement ever become necessary.

After the tiles are laid, clean, fine sand is spread over the surface and brushed or otherwise worked into the joints until they are well filled. This sand is allowed to remain on the pavement until dissipated by the gradual action of traffic or weather.







